



Graphene-Based Fuel Cell Membrane for Direct Methanol Fuel Cells (DMFCs)

BACKGROUND

Direct Methanol Fuel Cells (DMFCs) are a promising alternative to traditional batteries. Traditional battery limitations are a key restricting factor in the design and improvement of consumer electronics and other electronic products. All electronics, from laptops and smartphones to electric cars, are affected by the energy density and recharge rates of current battery technologies. These limitations are predicted to become a bigger hindrance as next-generation consumer electronics devices demand even more power and longevity.

DMFCs are seen as a breakthrough technology in portable energy. With extended run times and quick recharges they can significantly improve the performance and capabilities of portable electronics. DMFCs utilize cheap, stable, high energy-density methanol as their fuel. DMFCs on the market today almost exclusively use a proton exchange membrane (PEM) based around a conventional Nafion® system which decays at temperatures above 80°C.

THE TECHNOLOGY

The University of Manchester has developed a breakthrough graphene based PEM technology which allows DMFCs to operate at significantly higher efficiency. This graphene-based technology has been shown to improve DMFC performance significantly. This material can be modified with other substances to tailor the performance to various applications.

KEY BENEFITS

- Improved fuel cell performance
- Improved efficiency
- Cheaper production of fuel cell components than with existing technologies
- Higher energy densities

APPLICATIONS

- Use in consumer electronics such as smartphones, laptops and tablets
- Use in electric cars
- Use in other electric transport
- Stationary power generators to replace fossil fuel methods

UMIP - REPUTATION AND VALUE THROUGH INTELLECTUAL PROPERTY®

THE UNIVERSITY OF MANCHESTER INTELLECTUAL PROPERTY UMIP®



- Isolated power generation for camping, boats and other off-grid requirements
- Use as a power source on aeroplanes
- Use in military equipment with unique energy requirements
- Other non-fuel cell electrochemical systems

INTELLECTUAL PROPERTY

Patent filed

OPPORTUNITY

Contact for enquiries about assignment.

CONTACT

Stuart Holmes, Senior Lecturer, School of Chemical Engineering and Analytical Science, The University of Manchester, Sackville Street, Manchester, M13 9PL

✉ stuart.holmes@manchester.ac.uk ☎: ++44 (0)161 306 4376

Sandeep Singh, Commercialisation Executive, UMIP, Core Technology Facility, 46 Grafton Street, Manchester M13 9NT ✉ sandeep.singh@umip.com ☎: +44 (0) 161 306 8832

UMIP - REPUTATION AND VALUE THROUGH INTELLECTUAL PROPERTY®